

Has the Foreign Direct Investment Boosted Economic Growth in the European Union Countries?

Donny Tang*

Temple University, U.S.A.

Abstract: This study examines the foreign capital flow effects on the European Union (EU) economic growth during 1987-2012. The higher foreign direct investment (FDI) and portfolio investment (FPI) triggered by the European Monetary Union (EMU) have not contributed to growth. The lack of the FDI effect is surprising as they bring enormous benefits. Second, the higher bank development measured by bank credit flows has slowed growth because of the declining significance of bank-based financing. Third, the higher stock market development measured by stock market capitalization has accelerated growth. The larger stock markets due to the EU and euro effects provide larger financing for domestic investment, which boosts growth. Fourth, the FDI-stock market development interaction has increased the financing for FDI. This can enhance the positive externalities of FDI, thereby promoting growth. Finally, given the benefits of FDI over FPI, the EU countries can maintain sustainable higher growth by attracting more FDI.

Keywords: Economic integration; International investment; Financial market; Economic growth
JEL Codes: F15; F21; G1; O40

1. Introduction

The European Union (EU) countries have achieved the deeper financial integration through the European Monetary Union (EMU) since 1999. Both the financial market integration and the Single Market creation have further bolstered the EU appeal for foreign direct investment (FDI) and portfolio investment (FPI) inflows. FDI is always considered as a more favorable type of capital flow for economic growth than FPI. FDI brings enormous positive externalities such as technology transfer and management skills to the host country. More importantly, it represents a more long-term commitment than FPI as it involves a huge amount of capital investments which are more costly to reverse (Durham, 2004). Hence, FDI rather than FPI would be highly beneficial to the long-term economic growth. Given all these considerations, it is important to differentiate between the growth effect of FDI and FPI inflows into the EU countries. The objective of this study is to examine the FDI and FPI effect on the EU economic growth during the 1987-2012 period. Specifically, it would compare their growth effects before and after the EMU creation. Another major focus is to examine whether the magnitude of these growth effects would increase when the EU financial markets have become highly integrated after the euro launch. The higher financial market efficiency would facilitate more foreign capital inflows for productive investments. Even further, the growth effects would become stronger in the EU countries with good macroeconomic and institutional environments such as trade openness and

educational attainment. The FDI interacted with these intervening factors would further promote the EU growth. The overall results would have important implications for the long-term EU growth. To further boost their growth, the EU countries should develop different policies to attract FDI and FPI separately. Thus, they must improve their financial market efficiency to enhance the benefit of FDI. The eurozone debt crisis since 2010 has continued to slow the EU growth for the past few years. The results would provide valuable insights into accelerating the EU recovery in the foreseeable future.

This study would contribute to the literature in two aspects. First, this is the first paper to examine the effect of FDI and FPI on the EU economic growth. While a large number of studies have confirmed the positive growth effect of FDI, very few studies have focused on the growth effect of FPI despite its huge surge for the past decades. FDI has enormous positive externalities such as technology transfer and management skill. Due to their long-term benefits, FDI inflows tend to boost growth in the medium to long-term, compared to the short-term span of FPI inflows. In many cases, the acceleration of growth after the capital flow liberalization is usually driven by investment boom as a result of the increase in FPI inflows (Bussiere and Fratzscher, 2008). Hence, there is serious concern whether the huge FPI inflows have substantially promoted the EU growth after the EMU formation. The results would shed new light on the role of FPI as a crucial growth driver. This would influence the long-term EU policy toward FPI especially after the eurozone debt crisis being triggered by the surge in FPI. This study would contribute to the literature in the foreign capital flow effect on the EU growth. Second, the results would provide new insights into the prospect for the full EU recovery in the aftermath of the severe U.S. financial crisis since 2008. This has primarily caused the outbreak of the eurozone debt crisis since 2010. This study would provide valuable implications for the EU long-term growth performance. Contrary to the expectation, the deepened EU financial integration since 1999 has not substantially spurred the EU growth rates. Their average real gross domestic product (GDP) growth rates remained below 2 percent during the 2000s, which were much lower than the U.S. growth rates. The EMU formation has not significantly improved the overall EU growth prospect (De Grauwe, 2009). This combined with the U.S. financial crisis has led to their prolonged economic slowdown. This study that would identify the main determinants of growth would help accelerate the EU recovery over the medium to long run. This study would contribute to the literature in the EU growth performance during the EMU period. The remainder of the paper is organized as follows. Section 2 presents the literature review on the relationship between capital flows and economic growth. Section 3 describes the empirical methodology. Section 4 presents the results and discusses their significance. Section 5 explains their implications for the EU economic growth in the long term. Section 6 concludes.

2. Literature Review

The capital flow liberalization has led to the surge in capital flows across the borders since the 1990s. Most of the studies assert that FDI has primarily contributed to economic growth. In particular, FDI can promote technology transfer and catch-up. It can help achieve the higher GDP growth than domestic investment (Borensztein, De Gregorio, and Lee, 1998; Neto and Veiga, 2013). These studies also emphasize that FDI inflows can substantially promote growth in the host countries with certain level of absorptive capacity. The largest positive growth effect of FDI can only occur in countries with appropriate institutional and macroeconomic frameworks such as financial development and educational attainment (Alguacil, Cuadros, and Orts, 2011). The host countries can achieve higher growth if financial markets become highly developed to channel foreign capital efficiently to finance productive investment. Thus, the adverse macroeconomic conditions such as high inflation and external debt would increase uncertainty and therefore impede growth. Even the fiscal government policies can also lower growth. High government expenditures and deficits have strong negative effect on growth (Lensink, Bo, and Sterken, 1999). Lensink and Morrissey (2006) also find that FDI volatility would have very significant negative effect on growth.

In addition to FDI, FPI may have substantial effect on growth. Aizenman, Jinjarkak, and Park (2013) find that the FPI inflows have no significant positive effect on growth except access to foreign savings. Unlike FDI, FPI would not promote growth through foreign technology transfer and know-how. As FDI is more beneficial than FPI for growth, there is a need for selective and targeted policies to differentiate between different types of capital inflows. In contrast, Ferreira and Laux (2009) conclude that the openness to FPI inflows would be conducive to growth. The deeper financial integration has facilitated the FPI inflows into local equity investments, which would enhance growth. Thus, the volatility of FPI would not adversely affect growth. Similarly, Bussiere and Fratzscher (2008) confirm the positive effect of FPI on growth. However, the acceleration of growth immediately after capital flow liberalization is mainly driven by investment boom. FPI can only contribute to growth in the short term. In comparison, the FDI combined with better-quality domestic institutions after capital flow liberalization would contribute to growth in the medium to longer term. The result of FPI effect is corroborated by Durham (2004). The FPI inflows would boost growth in host countries with sufficient absorptive capacities including financial and institutional development. The deeper and more liquid stock markets would effectively absorb FPI to boost private investment.

A large number of recent studies point out that financial development has played a crucial role in boosting growth. An early study by King and Levine (1993) argues that the higher level of financial development such as stock market and banking sector is positively related to higher

economic growth rates, physical capital accumulation, and economic efficiency improvements after controlling for country and policy characteristics. De Gregorio and Guidotti (1995) posit that the banking development has strong positive effect on long-run real per capita GDP growth. This effect can be attributed to its impact on the efficiency of investment rather than its volume. More recent studies examine whether the financial development can still promote growth even during financial crisis. Rousseau and Wachtel (2011) conclude that financial deepening can have strong positive impact on growth during the crisis. Countries with higher level of financial development tend to have higher growth rates than those with lower level of financial development. The conclusion is very consistent with their earlier study (Rousseau and Wachtel, 2000). They highlight the important role of stock markets in boosting growth. The more developed equity markets would increase the amount of financing in the capital mobilization and resource allocation processes. The higher stock market liquidity measured by stock market capitalization would facilitate the transfer of surpluses from the short-term to long-term capital market and encourage the venture capital inflows and ultimately promote growth. Earlier studies have largely confirmed the importance of financial development for growth. Alfaro et al. (2004) and Alfaro, Kalemli-Ozcan, and Sayek (2009) emphasize that the developed financial markets can enhance the positive effect of FDI on growth. Countries with efficient financial markets are able to benefit more from FDI to boost their growth through technology transfer. This finding still holds even after controlling for their absorptive capacity including macroeconomic environment, infrastructure, and human capital. Beck, Levine, and Loayza (2000) support the argument that there exists a positive relationship between financial development and growth. Better functioning financial intermediaries improve resource allocation and accelerate total factor productivity growth with positive repercussions for long-run economic growth. Levine, Loayza, and Beck (2000) explain that the country differences in legal and accounting systems can help account for their differences in financial development. The results suggest that the legal and accounting reforms that strengthen creditor rights, contract enforcement, and accounting practices can boost financial development and accelerate economic growth. Rioja and Valev (2004) note that the finance-growth relationship would vary based on the host country's level of financial development. Those countries in the intermediate level of financial development would have the largest positive effect on growth than those in the low and high level. They also conclude that the market-based external financing has become the important source of growth determinant especially in countries with highly developed financial markets. This explains why the bank-based financial development has the declining effect on growth.

Levine (2001) asserts that international financial liberalization would accelerate growth as it would improve the functioning of financial markets and banks. The capital flow liberalization that would enhance stock market liquidity can spur growth by boosting productivity growth. Thus, greater foreign bank presence tends to enhance the efficiency of banking system. Better

banks would spur growth by accelerating productivity growth. Bekaert, Harvey, and Lundblad (2005) extend the analysis to the equity market liberalization effect on growth. The opening up of local securities markets would significantly boost annual per capita GDP growth. Furthermore, countries with better financial development, legal systems, institutions, and favorable FDI environment would experience a larger boost from the liberalization. Edison et al. (2002) point out that international financial integration would help accelerate economic growth when controlling for stock market and banking development. Beck and Levine (2004) also add that both stock market liquidity and bank development are important factors for higher growth. Stock markets provide different financial services from banks. Both would independently spur growth. The effect of financial development is especially prevalent in the EU countries as they have deepened their financial integration since the 1990s. Guiso et al. (2004) echo this view by arguing that the EU financial integration would have positive effect on the EU economic growth, especially in the manufacturing sectors. The integration has increased the large firms' access to capitals to finance their investment. Those countries with weak financial structure such as Belgium, Denmark, Greece, and Italy are predicted to benefit most, while those with relatively good financial structure such as the United Kingdom, Sweden, and the Netherlands are predicted to benefit little.

3. Econometric Specification

3.1. Estimation Model

This study would examine the foreign capital flow effects on the EU economic growth for the period 1987-2012. The main focus is to determine whether the FDI and FPI inflows would have significant positive effect on growth during the EMU period. In light of the deepening financial market integration since the late 1990s, more developed financial markets would efficiently allocate capitals to finance foreign capital flows for productive investment. To test this argument, this study would analyze whether the FDI inflows would help boost growth in the EU countries with well-developed financial markets. Another crucial issue is to examine whether the FDI inflows would promote growth in the EU countries with good institutional and macroeconomic frameworks. The open trade policy would facilitate the greater capital flow openness. Hence, the FDI inflows combined with higher trade flows would spur the EU growth. Finally, the EU countries with higher educational attainment would better exploit the positive externalities of FDI. The FDI inflows combined with educational attainment would promote the EU growth. The ordinary least squares (OLS) model estimating the EU economic growth is:

$$\begin{aligned} \log(GDPGrowth_{it}) = & \alpha + \beta_1 \log(DomInv_{it}) + \beta_2 \log(Trade_{it}) + \beta_3 \log(School_{it}) + \beta_4 \log(Lend_{it}) \\ & + \beta_5 \log(GovExp_{it}) + \beta_6 \log(PopGrow_{it}) + \beta_7 \log(CapFlow_{it}) \\ & + \beta_8 \log(BankCred_{it}) + \beta_9 \log(StkCap_{it}) + \alpha_i + \lambda_t + \gamma_i + \varepsilon_{it} \end{aligned} \quad (1)$$

where $GDPGrowth_{it}$ is the growth of real GDP per capita of the host country i at year t (1987-2012). All variables are measured in U.S. dollars adjusted for inflation to the base year 2005. The host countries include the 15 EU countries, in which 12 of them also belong to the eurozone countries.¹ The surge in foreign capital inflows triggered by the EU financial integration can further promote the EU growth. The EMU formation has facilitated the financial market integration among the eurozone countries as they have adopted the euro currency since 1999. More importantly, it also has very substantial effect on the EU financial markets because the major EU countries such as the United Kingdom have very strong economic ties with the eurozone countries. Hence, this study would include both the eurozone and EU countries in the sample to conduct a detailed analysis.

The foreign capital inflows into the EU countries ($CapFlow$) refer to either FDI or FPI . They are equal to the FDI or FPI divided by GDP . Given their different types of capital flows, the FDI and FPI would have different effects on the EU growth. The FDI would likely contribute to long-term growth as it has many positive externalities such as technology transfer. In comparison, the FPI would only promote short-term growth because it is mainly triggered by investment boom in speculative investment. The FDI and FPI independently would have positive effect on the EU growth over different time spans. Hence, it is important to test their growth effect separately. The other variables of interest are the EU stock market and bank variables ($StkCap$ and $BankCred$). The stock market capitalization variable ($StkCap$) is the total value of stocks listed on domestic market divided by GDP . It measures the stock market size relative to the economy. A larger value of $StkCap$ indicates a large country with larger stock market size. A country with well-developed stock market would have a larger stock market relative to the size of its economy (Beck and Levine, 2002). For the bank variable, $BankCred$ is the total amount of bank credits provided by deposit money banks to the private sectors divided by GDP . A large value of $BankCred$ indicates a higher level of financial services, which suggests a higher banking sector development (Levine, Loayza, and Beck, 2000).

The set of control variables are the crucial determinants of the EU growth. $DomInv$ refers to gross domestic investment as a share of GDP . It includes the expenditures on additions to fixed assets of the economy and net changes in inventory level as a share of GDP . $Trade$ is the sum of exports and imports of goods and services measured as a share of GDP . $School$ is the proportion of the labor force that has secondary education as a percentage of the total labor force. $Lend$ equals the amount of net lending or borrowing as a share of GDP . It may include national

disposable income (gross and net), consumption of fixed capital and net saving. *GovExp* measures the total government expenditures as a share of GDP. It includes both current and capital development expenditures and excludes lending minus repayment. *PopGrow* refers to the annual population growth rates.

To capture the fixed effects, equation (1) is controlled for both the country and time fixed effects. α_i measures the country fixed effects among the EU country i . The variation in these effects comes from the omitted variables that vary across the EU countries, but not over time. The inclusion of these effects would control for the omitted variable bias such as the individual EU country characteristics. The major EU countries such as the United Kingdom, Germany, and France have strong preference for high growth. Their economic and government policies are aimed at maintaining sustainable high growth through export growth and market expansion. The highly export-oriented countries such as Germany have comparative advantages in producing high-technology manufactured goods. Given the EU membership expansion toward the Central and Eastern Europe, these countries can further increase their exports to the new member countries, thereby boosting their growth. Hence, their tendency for higher growth would be captured by the country fixed effects. Moreover, λ_t measures the time fixed effects at year t for the period 1987-2012. The variation in these effects originates from the omitted variables that vary over time but not across the EU countries. The inclusion of these effects would eliminate the omitted variable bias such as the EU financial integration effect over time. It measures the two-stage EU integration effects on growth during 1987-2012. The EU countries have created the Single Market since the mid-1990s. Moreover, they have achieved the capital flow liberalization through the removal of the regulatory barriers and the harmonization of financial legislations since the 1990s. Subsequently, the euro introduction in 1999 has accelerated the eurozone financial market integration. The deepened integration has positive effect on the EU growth during the 1990s and 2000s, with the larger effect in the latter period due to the EMU formation. The integration effects for the past two decades are captured by the time fixed effects.

In addition to the fixed effects, equation (1) is also controlled for the random effects. γ_i represents the unobserved effects that are not correlated with all the explanatory variables during the time periods. The random effects estimation takes into account the variation between the EU countries and variation within these countries. Overall, the random effects model has advantage over the fixed effects model as the former allows for the inclusion of explanatory variables that are constant over time. Finally, ε_{it} is the error term.

3.2. Interaction Effects on Economic Growth

This study would further examine the role of FDI on the EU economic growth through financial markets. The EU stock markets have become highly integrated and liquid after the EMU formation. This would facilitate the surge in the FDI inflows into the stock markets. The interaction variable between FDI and stock market development would measure the significance of stock markets in enhancing the positive externalities of FDI inflows. Similarly, the EU banks have become more integrated after the EMU formation. The euro launch has led to more bank mergers and acquisitions as they can meet the growing competition. The banks become more efficient to allocate capitals to finance FDI for productive investment. The interaction variable between FDI and bank development would examine the significance of banks in bolstering the positive externalities of FDI inflows. Third, the EU trade flows would continue to increase as they have expanded their membership toward the Central and Eastern Europe. This would directly benefit the major exporting countries targeting these new markets. Meanwhile, the EU countries have steadily expanded trade beyond the EU toward the other regions. These countries with high trade orientation would become more open to the capital inflows from abroad. The FDI inflows and trade flows would reinforce each other. The interaction variable between FDI and trade flows would measure their joint effect on growth. Finally, the higher EU educational attainment is very conducive to achieving the FDI benefits. The EU countries with more educated labor force would better exploit the positive externalities of FDI inflows. The interaction variable between FDI and educational attainment would measure their joint effect on growth. To examine the interaction effects, equation (2) would include all of the above interaction variables. The ordinary least squares (OLS) model estimating the interaction effects is:

$$\begin{aligned} \log(GDPGrowth_{it}) = & \alpha + \beta_1 \log(DomInv_{it}) + \beta_2 \log(Trade_{it}) + \beta_3 \log(School_{it}) + \beta_4 \log(Lend_{it}) \\ & + \beta_5 \log(GovExp_{it}) + \beta_6 \log(PopGrow_{it}) + \beta_7 \log(CapFlow_{it}) \\ & + \beta_8 \log(BankCred_{it}) + \beta_9 \log(StkCap_{it}) + \beta_{10} \log(FDI_{it} * Trade_{it}) \\ & + \beta_{11} \log(FDI_{it} * School_{it}) + \beta_{12} \log(FDI_{it} * BankCred_{it}) \\ & + \beta_{13} \log(FDI_{it} * StkCap_{it}) + \alpha_i + \lambda_t + \gamma_i + \varepsilon_{it} \end{aligned} \quad (2)$$

Equation (2) is derived by adding the four interaction variables to equation (1). The two main interaction variables ($FDI * StkCap$ and $FDI * BankCred$) examine the importance of FDI on the EU growth through the stock market and bank development, respectively. The FDI-stock market interaction variable ($FDI * StkCap$) measures the growth effect of FDI interacted with stock market capitalization. The EU countries with highly developed stock markets would have the larger stock markets relative to the size of their economies as indicated by the high value of $StkCap$. The EU stock markets have become highly integrated and liquid after the EMU formation. The higher stock market efficiency can stimulate the demand for external finance and

therefore expand the stock market size (Guiso et al., 2004). This can further boost the FDI inflows into the stock markets. *FDI*StkCap* measures the impact of the stock market development in bolstering the FDI effect on growth. For the FDI-bank interaction variable, *FDI*BankCred* measures the growth effect of FDI interacted with bank credit flows. The high value of *BankCred* reflects that the EU banking sectors are well-functioning in terms of high availability of credits offered by deposit-taking corporations to the private sector. The increase in bank mergers after the euro launch would improve the bank efficiency and reduce the financial intermediation cost. This would create better credit conditions and therefore stimulate FDI (Koetter and Wedow, 2010). *FDI*BankCred* measures the impact of bank development in promoting the FDI effect on growth.

*FDI*Trade* measures the growth effect of FDI interacted with trade flows. The higher EU familiarity with other countries through trade would spur their FDI inflows into the EU countries. The stronger trade ties would bolster short-term financial linkages through trade financing. It would create demand and supply channels through which the foreign companies can gain greater access to the capitals. This would make it less costly for the foreign companies to invest in the EU countries (Guerin, 2006). Therefore, the higher trade flows would promote the FDI in the EU countries. The interaction variable between FDI and trade flows (*FDI*Trade*) would capture the role of trade flows in expanding the FDI effect on growth. Finally, *FDI*School* measures the growth effect of FDI interacted with secondary school enrollment. The larger percentage of labor force with secondary school education would be beneficial for growth because of the greater potential for higher labor productivity. The higher educational attainment can better facilitate the technology transfer to the local firms through FDI. Hence, *FDI*School* measures the impact of educational attainment in bolstering the positive externalities of FDI on growth.

3.3. Lagged Effects on Economic Growth

There may exist the lagged FDI and financial development effect in equations (1) and (2). The FDI inflows have delayed effect on the EU growth because of their positive externalities. The FDI would bring about technology transfer and management skills to the EU countries. These benefits would take some time to exert influence on the EU growth. Hence, the FDI inflows would have a lagged effect on the EU growth. Second, the EU financial development also has a lagged effect on the EU growth due to the financial system emphasis. The major EU countries such as Germany and France are dominated by the bank-based financial system. To remain competitive after the euro launch, the EU banks have improved their operation efficiency through merger and acquisition activities. But all these would take a while to increase the bank efficiency which would contribute to the EU growth. The rapid bank development interacted with FDI inflows would have a lagged effect on the EU growth. Third, some of the major EU

countries such as the United Kingdom and the Netherlands are dominated by the market-based financial system. The higher stock market liquidity due to the euro launch would boost foreign capital inflows into stock markets as investors assume that they can sell their equities more quickly. This would further improve capital allocation and productivity growth, thereby promoting higher growth (Levine, 2001). But the benefits of the whole integration process would take some time to appear. The higher stock market development interacted with FDI inflows would have a lagged effect on the EU growth.

The two control variables may have lagged effect on the EU growth. As mentioned above, the higher trade flows would boost growth through the increase in FDI inflows. The trade impact on FDI would take some time to take effect. Hence, the trade flows would have a lagged effect on the EU growth. Similarly, the higher educational attainment would spur growth by better exploiting the positive externalities of FDI. More educated labor force would take a while to facilitate the technology transfer. Hence, the educational attainment would have a lagged effect on the EU growth.

To address the lagged effect issue, the FDI, bank, stock market, trade, and school variables (*FDI*, *BankCred*, *StkCap*, *Trade*, and *School*) in equation (1) are lagged by one year. Moreover, the FDI interaction with bank and stock market development would have lagged effect on the EU growth. Hence, both the FDI-bank development and FDI-stock market development variables (*FDI*BankCred* and *FDI*StkCap*) in equation (2) are lagged by one year.

3.4. Two-Stage Least Squares and Generalized Method of Moments Estimations

Equations (1) and (2) are initially estimated by the OLS method. However, there may be endogeneity problem in the main explanatory variables. It is possible that both the foreign capital inflows and financial development would increase with higher economic growth. The foreign capital inflows can promote the EU growth due to their positive externalities. But the countries with higher growth can attract more foreign capital inflows as they are considered to be more profitable by investors. Similarly, the EU financial development would promote the EU growth through the surge in FDI. It is possible that the higher growth would increase the demand for financial services, which in turn would accelerate the financial development. To resolve the endogeneity problem, this study would use the two-stage least squares (2SLS) method to re-estimate the endogenous variables (*FDI*, *FPI*, *BankCred*, and *StkCap*). It is important to find the variables that are highly correlated with these variables but are not correlated with ε_{it} . The instrumental variables (IV) would replace these endogenous variables in equation (1). To take into account the fixed effects, the 2SLS method would also control for the country fixed effects. The Hausman test is used to examine whether the foreign capital inflows (*FDI* and *FPI*) are

endogenous. To determine the endogeneity of *FDI* and *FPI*, the test first obtains the first stage residuals and then includes it in equation (1) as an extra explanatory variable. The residual series for *FDI* is statistically significant at the 10% level. Surprisingly, the residual series for *FPI* is not statistically significant at all. The results indicate that *FDI* is endogenous, whereas *FPI* is not endogenous.² Similarly, to test the endogeneity of *BankCred* and *StkCap*, the test obtains the first stage residuals and then includes it in equation (1) as an extra explanatory variable. The residual series for both *BankCred* and *StkCap* are statistically significant at the 5% level. The results strongly suggest that *BankCred* and *StkCap* are endogenous.³

Having confirmed the endogeneity of these variables, this study would next determine whether the IV for these variables are appropriate. The Wald tests are used to test the joint significance of the IV (*PrivCred*, *Saving*, *GDP*, *Turnover*, *Inflat*, and *ExchRate*) for *BankCred*, *StkCap*, and *FDI*. *PrivCred* equals the credit value provided by financial intermediaries to the private sector divided by GDP. It measures the total credits issued to the private sectors, but excludes the credits issued to governments and public agencies. *Saving* is the amount of GDP minus the final consumption expenditure. It refers to the amount of domestic saving available for bank credit and private credit flows. *GDP* is the gross domestic product of the EU countries. *Turnover* equals the value of stocks traded divided by the total value of stocks listed on domestic market. *Turnover* is adjusted for pure price increase effect as both the numerator and denominator have the price components (Beck and Levine, 2004). *Inflat* is the annual growth rate of the GDP implicit deflator. It shows the rate of price change in the EU countries. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency. Finally, *ExchRate* is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs. The results of Wald test indicate the large F-statistic value, confirming that the IV are suitable for the endogenous variables.⁴ The 2SLS would re-estimate equations (1) and (2) by replacing *FDI*, *BankCred*, and *StkCap* with the IV results.

In addition to the 2SLS method, equations (1) and (2) are re-estimated by the system generalized method of moments (GMM) method to control for the biases related to endogeneity, omitted variables, and unobserved country fixed effects. It can also address the heteroskedasticity and serial correlation problem. The first difference procedure is chosen as the transformation method to remove the cross-section fixed effects. The IV mentioned above are included as the IV in the system GMM method.

Almost all the data on the explanatory variables including the IV are obtained from the World Bank database. All of them except the turnover variable are expressed as a percentage of GDP. While the data on *FDI* are obtained from the World Bank database, the data on *FPI* are drawn

from the International Monetary Fund's *International Financial Statistics*. The data on net lending are taken from the Organization for Economic Cooperation and Development (OECD) statistical extract.

4. Estimation Results

4.1. FGLS, 2SLS, and GMM Results

Tables 1 to 3 present the results for specifications including the FDI and FPI variables, respectively. Table 1 reports the fixed effects, random effects, and feasible generalized least squares (FGLS) results. The FGLS estimations yield the cross-section weights results controlling for the cross-section heteroskedasticity. The two capital flow variables (*FDI* and *FPI*) show quite different results. As seen in columns (5) and (6) of Table 1, the coefficient on *FPI* is statistically significant in the random effects and FGLS estimations, while the coefficient on *FDI* is never significant. More importantly, the results for the financial development variables remain very similar across different specifications. The significant coefficients on *StkCap* and *BankCred* are consistently positive and negative, respectively. The main control variables (domestic investment, lending, government expenditure, and population) are very significant with the expected signs. In contrast to the fixed effects and FGLS estimations, the 2SLS and GMM estimations yield more different results on the main explanatory variables. Table 2 presents the 2SLS and GMM results for the specification including *FDI*. The pooled results are shown in columns (1) and (4), whereas the subperiod results (1987-1999 and 2000-2012) are shown in the rest of the columns. The subperiod estimations would allow us to better compare the EMU effect on the EU growth before and after the EMU formation. Both estimations yield very different results for the financial development variables. The coefficient on *BankCred* remains negative for all subperiods. Surprisingly, the 2SLS coefficient on *StkCap* becomes positive for 1987-1999, compared to the positive GMM coefficient for 2000-2012. The only consistent result is the insignificant coefficient on *FDI* in both estimations. Finally, the trade variable has very different results as the coefficient is positive in the GMM estimation, but becomes negative in the 2SLS estimation.

Table 3 presents the 2SLS and GMM results for the specification including *FPI*. The financial development variables are highly significant across different subperiods. The 2SLS coefficient on *BankCred* remains negative in all subperiods, compared to the GMM coefficient for 1987-1999. The coefficient on *StkCap* is highly significant and positive for the entire period 1987-2012. But its 2SLS coefficient only remains marginally significant for 2000-2012. Thus, the 2SLS coefficient on *Trade* only becomes highly significant for 1987-1999. Overall, the 2SLS and GMM estimations confirm the significant effects of the financial development variables on

the EU growth in different subperiods. Compared to the fixed and FGLS estimations, they provide better estimation of equation (1) as they control for the problems related to endogeneity, omitted variables, and unobserved country fixed effects. The GMM estimation can also address the heteroskedasticity and serial correlation problem. For brevity, the rest of the discussions would focus on the 2SLS and GMM results.

4.2. Results for the Foreign Capital Inflow and Financial Development Effect on Growth

This study examines whether the EU financial integration has promoted the EU economic growth during 1987-2012. It argues that the EMU formation since 1999 has boosted the foreign capital inflows into the EU countries as foreign investors find it more profitable to invest in the larger integrated markets. Moreover, the deepened stock market and bank integration have facilitated more of these capital inflows through the increasing supply of financing. The overall results provide no support for this argument. As shown in Tables 2 and 3, both of the coefficients on FDI_t and FPI_t are not statistically significant in both 2SLS and GMM estimations. Thus, there is no evidence of the lagged FDI effect on growth as the coefficient on FDI_{t-1} is not statistically significant at all in Table 4. The lack of the growth effect of FPI is very expected because of the speculative nature of the investment flow. The FPI inflows have little impact on the long-term growth as they would not bring substantial benefits except access to foreign capitals (Aizenman, Jinjark, and Park, 2013). The surge in FPI is usually triggered by brief investment boom. Since the FPI inflows are mainly allocated to non-productive investment, they can only contribute to the short-term growth (Bussiere and Fratzscher, 2008). The result of this study confirms this argument. For the FDI variable, its lack of the growth effect is very surprising given its substantial benefits on growth. The FDI inflows would lead to the long-term growth because they involve enormous positive externalities such as technology transfer to the EU countries. It can stimulate research activities and therefore accelerate innovation progress. Countries with more FDI inflows tend to have the greater capability in technology catch-up. They can achieve the higher productivity growth and GDP growth (Neto and Veiga, 2013). Compared to the FPI inflows, the FDI inflows are more stable and involve long-term commitment. As they need huge amount of capital investment, they are more costly to reverse (Durham, 2004). Therefore, the FDI inflows should have strong positive effect on the EU growth. However, the result of this study indicates that there is no growth effect of FDI either before or after the EMU formation.

It is important to examine the impact of domestic investment on growth controlling for the FDI effect. FDI would facilitate the local firm expansion by complementarity in production or by higher productivity through technology spillover. This in turn may boost the domestic investment. Conversely, by competing in product and financial markets, FDI inflows would displace local firms. They may diminish the domestic investment (Borensztein, De Gregorio, and

Lee, 1998). In this case, the domestic investment may have either positive or negative effect on growth when the FDI effect is taken into account. As shown in Table 2, the 2SLS and GMM coefficients on *DomInv* are all statistically significant and positive throughout 1987-2012. The subperiod results further indicate that the magnitude of the coefficient diminishes after the EMU formation. It dramatically decreases from 5.405 in 1987-1999 to 1.764 in 2000-2012. This suggests that the domestic investment would lead to the higher growth as the FDI inflows may boost the local firm's productivity through technology transfer. More importantly, this result also confirms that the FDI inflows would not crowd out the domestic investment in the EU countries. The domestic investment appears to be a significant growth driver during the pre-EMU rather than EMU period.

Another major issue of this study is to examine the EMU impact on growth. Specifically, it examines whether the EU bank and stock market development have substantially affected the EU growth after the EMU formation. The overall results suggest that the EU bank and stock market development have very contrary effects on growth. As reported in Tables 2 and 3, the 2SLS and GMM coefficients on *BankCred_t* are highly significant but remain negative for the entire period. Moreover, the bank credit flow has no lagged effect on growth as the coefficient on *BankCred_{t-1}* is not statistically significant at all in Table 4. This indicates that the higher bank credit flow has slowed the EU growth throughout 1987-2012. This effect has lingered before and after the EMU formation. This can be related to the declining significance of the bank development on growth. Due to the deepened stock market integration, the market-based rather than bank-based external financing has become more dominant in the EU countries as they have developed highly liquid stock markets. This has led to the declining significance of bank-based financing in these countries (Rioja and Valev, 2004). This explains why the bank credit flow has failed to spur the EU growth despite the EMU formation.

In contrast to the negative bank credit effect, the stock market capitalization has promoted the EU growth. As shown in Tables 2 and 3, the 2SLS and GMM coefficients on *StkCap_t* are highly significant and positive during 1987-2012. Even further, there appears to be stronger lagged effect of stock market capitalization on growth. As reported in Table 4, the 2SLS coefficient on *StkCap_{t-1}* (2.286) is larger than that on *StkCap_t* (1.086). This implies that the larger stock market size effect has become the main growth determinant for the entire study period. The subperiod results further suggest that the magnitude of this effect varies drastically before and after 1999. The 2SLS results indicate that this effect seems to be stronger for 1987-1999, whereas the GMM results only confirm this for 2000-2012. The stock market size effect during the pre-EMU period can be explained by the strong EU membership effect during the 1990s. The Maastricht Treaty adopted in 1993 has outlined the path to harmonize national regulations which would prepare for the EMU formation (Bekaert et al., 2013). The EU equity markets have become more integrated

because of the EU formation effect. During the EMU period, the deepened stock market integration through the euro launch has expanded the stock market size in the money, credit, equity, corporate and government bond markets. The creation of more integrated and liquid stock markets would facilitate the EU access to the larger pool of external financing (Lorca-Susino, 2010). This would improve resource allocation for domestic investment. Taken together, the stock market integration would accelerate the EU growth before and after the EMU formation.

In addition to the financial development, the trade flows play a crucial role in promoting the EU growth. The trade flows have significant and positive effect on growth when controlling for the FDI effect. As shown in Table 2, the GMM coefficient on *Trade* is highly significant and positive for 1987-2012 when the coefficient on *FDI* is included in the estimation. The coefficient shows a higher value (6.385) during 1987-1999, compared to insignificant coefficient during 2000-2012. In Table 3, the coefficient becomes insignificant when controlling for the *FPI* effect. This indicates that the trade flows appear to be the main growth determinant especially before the EMU formation when the FDI inflows are taken into consideration. Second, it is interesting to point out that the trade flows have mainly contributed to growth before the EMU formation, whereas the stock market development has assumed this role after the EMU formation. The subperiod results in Table 2 clearly reveal that the GMM coefficient on *Trade* becomes significant in 1987-1999, whereas the coefficient on *StkCap* becomes significant in 2000-2012. The lack of the trade effect after the EMU formation can be attributed to the dominant growth effect of the deepened stock market integration. The EU Single Market creation during the 1990s has substantially boosted the intra-EU trade flows and therefore accelerated growth. The stock market size has further expanded as the EU stock markets have become more integrated after the euro launch. Hence, the stock market size can be substituted for trade flows to become the main growth determinant during the EMU period. Another explanation is that the trade flows would spur growth through the financial development. The higher trade openness would lead to the rapid financial development through capital flow liberalization. The more liquid and larger financial markets would boost the EU growth as they provide sufficient capitals to finance domestic investment for productive activities (Bordo and Rousseau, 2012). The result of this study confirms that the trade flow has exerted a significant influence on growth when controlling for the financial development.

4.3. Results for the Interaction Effect between FDI and Financial Development on Growth

Another major issue is whether the FDI has played a crucial role in boosting the EU economic growth through financial markets. The main focus is the interaction effect between the FDI inflows and financial development. The bank merger and acquisition activities triggered by the EMU have improved the bank efficiency in allocating capitals to finance FDI. The interaction

between FDI and bank development would boost the positive externalities of FDI on growth. Meanwhile, the EMU through the euro launch has accelerated the EU stock market integration and therefore promoted the FDI inflows into the EU countries. Specifically, the interaction between FDI and stock market development would bolster the positive externalities of FDI on growth. The overall results confirm the importance of the FDI interaction with bank and stock market development, respectively. The FDI inflows would contribute to the higher growth in the EU countries with high level of financial development. As shown in Table 6, the 2SLS and GMM coefficients on $FDI_t * BankCred_t$ are statistically significant but remain negative for the entire period 1987-2012. It is surprising to find that the FDI-bank credit interaction continues to decrease rather than increase growth even after the EMU formation. The coefficients in columns (3) and (6) remain negative in 2000-2012. This result is also confirmed by the lagged results in Table 7. As reported in column (2), the 2SLS coefficient on $FDI_{t-1} * BankCred_{t-1}$ is negative (-1.195), but the GMM coefficient becomes positive (0.963) in column (3). This indicates that the FDI inflow has contemporaneous negative effect on growth, but has lagged positive effect on growth. The reason for the weak interaction effect is that the EU banking sectors are still not highly integrated despite the deepened financial integration. The financial regulations remain under the national responsibilities of individual countries. The broad legislative measures adopted at the EU level have not been effective in opening up the financial markets (Grossman and Leblond, 2011). The lack of unified supervision and regulations has slowed the progress of the bank integration. Another explanation is the limited scope of the bank integration. To better compete after the euro launch, the larger EU banks have engaged in bank consolidations through mergers and acquisitions since the mid-1990s (Maddaloni and Sorensen, 2005). However, most of these mergers are domestic rather than cross-border in nature. Even the cross-border bank mergers among the larger banks would only expand their business lines across the EU countries. Therefore, these merger activities have not improved the overall bank efficiency. This may explain the lack of any positive FDI-bank credit interaction effect on the EU growth.

In contrast to the FDI-bank credit interaction, the FDI-stock market capitalization interaction has the positive effect on growth. As noted in Table 6, the 2SLS and GMM coefficients on $FDI_t * StkCap_t$ are all significant and positive for the entire period. This indicates that the FDI interaction with the stock market size has exerted a positive effect on growth throughout 1987-2012. In particular, this interaction effect has been further increased by the EMU formation. The 2SLS coefficient increases from 1.011 in 1987-1999 to 2.533 in 2000-2012 and from 0.584 in 1987-1999 to 0.996 in 2000-2012 for the GMM coefficient. The lagged estimation has confirmed this result. As noted in Table 7, the significant 2SLS coefficient on $FDI_{t-1} * StkCap_{t-1}$ is positive as expected, but the GMM coefficient turns negative. This suggests that the FDI inflow has contemporaneous and possibly lagged positive effect on growth in the EU countries with larger stock markets. The well-developed stock markets can improve the information flows from

management to owners and produce accurate market evaluation of company development. This can ensure their better monitoring of risky but high-return projects (Rousseau and Wachtel, 2000). The larger stock markets can boost the financing for the FDI. This can further enhance the positive externalities of FDI (Alfaro et al., 2004). This explains why the FDI-stock market size interaction has the larger growth effect after the EMU formation.

Finally, this study also examines the FDI interaction with trade and schooling to determine their impact on growth. As presented in columns (1), (2), and (4) in Table 5, the overall FGLS results indicate that the coefficients on *FDI*Trade* and *FDI*School* are not statistically significant. This suggests that the relationship between FDI and growth is not contingent on the level of trade flows. The higher trade flows due to the EU membership expansion combined with the FDI inflows would not boost the EU growth throughout 1987-2012. Moreover, there is no evidence of interaction effect between FDI and educational attainment on growth. The FDI inflow would not spur the EU growth despite their high educational attainment. It reflects that the educational attainment by itself would not be a crucial factor for attracting FDI inflows into the EU countries.

5. Implications for the Long-Term EU Economic Growth

The results would have very important implications for the EU economic growth over the long run. They provide very insightful suggestions on how to accelerate the EU economic recovery after the eurozone debt crisis. First, there is evidence of a complementary relationship between trade and financial development and their impact on the EU growth. Trade flows and financial development have strongly reinforced each other and this linkage has promoted growth (Bordo and Rousseau, 2012). The EU Single Market creation during the 1990s has bolstered the trade effect on the EU growth. Subsequently, the EMU formation since 1999 has facilitated the EU financial integration. The capital market liberalization would further spur their trade flows. The trade flows and financial development can strongly reinforce each other and jointly boost their long-term growth. More coherent policies should be developed to accelerate the EU stock market and bank integration so that they can provide more capitals to finance trade financing. Some of the financial markets such as the banking sector are still not highly integrated despite the EMU formation. Once they have become more integrated, their higher efficiency would boost the trade flows. This in turn can boost the EU long-term growth.

While the FDI and FPI inflows have no impact on growth, the FDI-financial development interaction has the significant and positive effect on growth. This confirms the need for the EU countries to differentiate between FDI and FPI. The EMU formation has further boosted the intra-EU FDI and FPI flows during the 2000s. The FPI inflows triggered by investment boom can only contribute to the short-term growth. In contrast, the FDI inflows can contribute to the

long-term growth as they can increase productivity through diffusion of technology (Neto and Veiga, 2013). The EU countries can exploit the benefits of FDI on domestic investment and increase the productivity and GDP growth through technology transfer. The FDI inflows can augment the existing level of knowledge through labor training, skill acquisition, and new management practices (Alguacil, Cuadros, and Orts, 2011). As the results confirm, the positive effect of domestic investment on growth has remained strong after the EMU formation. Given the substantial benefits of FDI over FPI, the EU countries should promote growth by attracting more FDI rather than FPI inflows. They can maintain sustainable high growth by boosting the FDI effect on domestic investment.

There appears to be the strong FDI-stock market size interaction effect on growth after the EMU formation. The deepened stock market integration has increased the stock market size and FDI inflows into the EU countries. The stock market size effect would further intensify because the euro launch has improved the stock market efficiency. This would ensure better resource allocation and accelerate total factor productivity and GDP growth (Beck, Levine, and Loayza, 2000). The euro launch has also boosted the FDI inflows as it has facilitated capital flow liberalization among the EU countries. The better functioning stock markets would increase the amount of external financing for FDI inflows, which can better stimulate domestic investment (Schularick and Steger, 2010). In the next few years, the stock markets would increasingly become a major source of financing as the banking sectors have severely tightened the bank credit flows in light of the eurozone debt crisis. The EU countries with better developed stock markets can expand the FDI inflows to accelerate their long-term growth.

Given the benefits of FDI and trade for growth, the EU countries should reach the transatlantic free trade agreement [i.e., Transatlantic Trade and Investment Partnership (TTIP)] with the U.S. as soon as possible. The FDI and trade provisions would lead to the higher U.S. FDI and trade flows with the EU countries. Since the U.S. and the EU countries have the largest markets in the world, there still exist substantial opportunities for market expansion (Krist, 2013). While they have maintained very low trade barriers, the TTIP can further expand their trade flows by eliminating the remaining regulatory trade barriers. Moreover, the implementation would increase their FDI due to the inclusion of the investment liberalization provisions (Crotti, Cavoli, and Wilson, 2010). In addition to eliminating the remaining barriers to capital flows, very detailed investment provisions would be more effective in further boosting the FDI. These include the guarantees of market access for foreign investors by national treatment, most-favored nation treatment, and credible commitments against discriminatory and discretionary treatment. These provisions combined with effective dispute settlement would help promote the transatlantic FDI (Berger et al., 2013). As the trade and FDI flows are the main EU growth determinants, the implementation of TTIP would promote their long-term growth.

6. Conclusion

This study examines the foreign capital flow effects on the EU economic growth for the period 1987-2012. Contrary to the expectation, the higher FDI and FPI inflows triggered by the EMU have not contributed to the growth. The lack of the FDI effect is very surprising because the higher technology catch-up would accelerate the productivity growth and GDP growth. Since these inflows involve huge amount of capital investments, they are very costly to reverse. Second, the bank and stock market development have very contrary effects on the growth. The EU bank credit flows have consistently slowed the growth. This may be related to the declining significance of bank-based financing after the deepened stock market integration. In contrast, the stock market capitalization has actually boosted the growth. The strong stock market size effect during the pre-EMU period may be explained by the EU membership effect during the 1990s. The euro launch during the EMU period has further expanded the stock market size. This has increased the financing for domestic investment, thereby spurring the growth. Third, the FDI interacted with bank development has a lagged positive effect on the growth. But this effect remains rather weak because the EU banking sectors are still not fully integrated despite the EMU formation. The lack of unified supervision and regulations has slowed the progress of the bank integration. Thus, there is only a limited scope of the bank integration. The bank mergers and acquisitions have not improved the overall bank efficiency. Finally, the FDI interacted with stock market development has the expected positive effect on the growth. The larger stock markets can boost the financing for the FDI. This can further enhance the positive externalities of FDI, thereby promoting the growth.

The results would have important implications for the EU long-term growth. While the FDI and FPI inflows have no impact at all, the FDI-financial development interaction has positive effect on the growth. This confirms the need for the EU countries to differentiate between FDI and FPI. The FDI has enormous positive externalities such as technology transfer that can boost the productivity and GDP growth. As the FDI can contribute to the long-term growth, the EU countries should attract more FDI rather than FPI inflows over the long run. Second, given the benefits of FDI and trade for growth, the EU countries should reach the transatlantic free trade agreement with the U.S. as soon as possible. The FDI and trade provisions would lead to the higher U.S. FDI and trade flows with the EU countries. In particular, the implementation would increase their FDI due to the inclusion of the investment liberalization provisions. In addition to eliminating the remaining barriers to capital flows, very comprehensive investment provisions would be more effective in further boosting the FDI. As the trade and FDI flows are the main EU growth determinants, the implementation of the agreement would promote their long-term growth.

Endnotes

*Corresponding address: Department of Economics, Temple University, Philadelphia, PA, U.S.A. 19122; E-mail: dnytng@gmail.com.

1. The EU countries include Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom. All of them except Denmark, Sweden, and the United Kingdom are also the eurozone countries. The rest of the 12 EU countries are excluded due to the data availability problem.

2. The results are available upon request.

3. The results are available upon request.

4. The results are available upon request.

References

Aizenman, J., Y. Jinjarkak, and D. Park. 2013. "Capital Flows and Economic Growth in the Era of Financial Integration and Crisis." *Open Economies Review* 24(3): 371-396.

Alfaro, L., A. Chanda, S. Kalemli-Ozcan, and S. Sayek. 2004. "FDI and Economic Growth: The Role of Local Financial Markets." *Journal of International Economics* 64(1): 89-112.

Alfaro, L., S. Kalemli-Ozcan, and S. Sayek. 2009. "FDI, Productivity, and Financial Development." *World Economy* 32(1): 111-135.

Alguacil, M., A. Cuadros, and V. Orts. 2011. "Inward FDI and Growth: The Role of Macroeconomic and Institutional Environment." *Journal of Policy Modeling* 33(3): 481-496.

Beck, T. and R. Levine. 2002. "Industry Growth and Capital Allocation: Does Having a Market- or Bank-Based System Matter?" *Journal of Financial Economics* 64(2): 147-180.

Beck, T. and R. Levine. 2004. "Stock Markets, Banks, and Growth: Panel Evidence." *Journal of Banking and Finance* 28(3): 423-442.

Beck, T., R. Levine, and N. Loayza. 2000. "Finance and the Sources of Growth." *Journal of Financial Economics* 58(1-2): 261-300.

- Bekaert, G., C. R. Harvey, C. Lundblad.** 2005. "Does Financial Liberalization Spur Growth?" *Journal of Financial Economics* 77(1): 2-25.
- Bekaert, G., C. R. Harvey, C. T. Lundblad, S. Siegel.** 2013. "The European Union, the Euro, and Equity Market Integration." *Journal of Financial Economics* 109(3): 583-603.
- Berger, A., M. Busse, P. Nunnenkamp, and M. Roy.** 2013. "Do Trade and Investment Agreements Lead to more FDI? Accounting for Key Provisions Inside the Black Box." *International Economics and Economic Policy* 10(2): 247-275.
- Bordo, M. and P. L. Rousseau.** 2012. "Historical Evidence on the Finance-Trade-Growth Nexus." *Journal of Banking and Finance* 36(4): 1236-1243.
- Borensztein, E., J. De Gregorio, and J. W., Lee.** 1998. "How Does Foreign Direct Investment Affect Economic Growth?" *Journal of International Economics* 45(1): 115-135.
- Bussiere, M. and M. Fratzscher.** 2008. "Financial Openness and Growth: Short-Run Gain, Long-Run Pain?" *Review of International Economics* 16(1): 69-95.
- Crotti, S., T. Cavoli, and J. K. Wilson.** 2010. "The Impact of Trade and Investment Agreements on Australia's Inward FDI Flows." *Australian Economic Papers* 49(4): 259-275.
- De Grauwe, P.** 2009. "The Euro at Ten: Achievements and Challenges." *Empirica* 36(1): 5-20.
- De Gregorio, J. and P. E. Guidotti.** 1995. "Financial Development and Economic Growth." *World Development* 23(3): 433-448.
- Durham, J. B.** 2004. "Absorptive Capacity and the Effects of Foreign Direct Investment and Equity Foreign Portfolio Investment on Economic Growth." *European Economic Review* 48(2): 285-306.
- Edison, H. J., R. Levine, L. Ricci, and T. Slok.** 2002. "International Financial Integration and Economic Growth." *Journal of International Money and Finance* 21(6): 749-776.
- Ferreira, M. A. and P. A. Laux.** 2009. "Portfolio Flows, Volatility, and Growth." *Journal of International Money and Finance* 28(2): 271-292.

Grossman, E. and P. Leblond. 2011. "European Financial Integration: Finally the Great Forward?" *Journal of Common Market Studies* 49(2): 413-435.

Guerin, S. S. 2006. "The Role of Geography in Financial and Economic Integration: A Comparative Analysis of Foreign Direct Investment, Trade and Portfolio Investment Flows." *World Economy* 29(2): 189-209.

Guiso, L., T. Jappelli, M. Padula, and M. Pagano. 2004. "Financial Market Integration and Economic Growth in the EU." *Economic Policy* 19(4): 523-577.

King, R. and R. Levine. 1993. "Finance and Growth: Schumpeter Might Be Right." *Quarterly Journal of Economics* 108(3): 717-737.

Koetter, M. and M. Wedow. 2010. "Finance and Growth in a Bank-Based Economy." *Journal of International Money and Finance* 29(8): 1529-1545.

Krist, W. 2013. *Globalization and America's Trade Agreements*. Johns Hopkins University Press. Baltimore, Maryland.

Lensink, R. and O. Morrissey. 2006. "Foreign Direct Investment: Flows, Volatility, and the Impact on Growth." *Review of International Economics* 14(3): 478-493.

Lensink, R., H. Bo, and E. Sterken. 1999. "Does Uncertainty Affect Economic Growth? An Empirical Analysis?" *Review of World Economics* 135(3): 379-396.

Levine, R. 2001. "International Financial Liberalization and Economic Growth." *Review of International Economics* 9(4): 688-702.

Levine, R., N. Loayza, and T. Beck. 2000. "Financial Intermediation and Growth: Causality and Causes." *Journal of Monetary Economics* 46(1): 31-77.

Lorca-Susino, M. 2010. *Euro in the 21st Century: Economic Crisis and Financial Uprouar*. Surrey, England: Ashgate Publishing Limited.

Maddaloni, A. and C. K. Sorensen. 2005. "How are Euro Area Financial Structures Changing?" in *Elements of the Euro Area: Integrating Financial Markets*, (eds.) Jerper Berg,

Mauro Grande, and Francesco Paolo Mongelli, pp. 85-116. Aldershot, England: Ashgate Publishing Limited.

Neto, D. G. and F. J. Veiga. 2013. "Financial Globalization, Convergence and Growth: The Role of Foreign Direct Investment." *Journal of International Money and Finance* 37: 161-186.

Rioja, F. and N. Valev. 2004. "Does One Size Fit All? A Reexamination of the Finance and Growth Relationship." *Journal of Development Economics* 74(2): 429-447.

Rousseau, P. L. and P. Wachtel. 2011. "What is Happening to the Impact of Financial Deepening on Economic Growth?" *Economic Inquiry* 49(1): 276-288.

Rousseau, P. L. and P. Wachtel. 2000. "Equity Markets and Growth: Cross-Country Evidence on Timing and Outcomes." *Journal of Banking and Finance* 24(12): 1933-1957.

Schularick, M. and T. M. Steger. 2010. "Financial Integration, Investment, and Economic Growth: Evidence from Two Eras of Financial Globalization." *Review of Economics and Statistics* 92(4): 756-768.

Table 1: OLS & FGLS Estimates of the EMU Effect on Economic Growth

	(1)	(2)	(3)	(4)	(5)	(6)
	1987-2012	1987-2012	1987-2012	1987-2012	1987-2012	1987-2012
	Fixed	Random	Cross-Section	Fixed	Random	Cross-
	Effect	Effect	Weights	Effect	Effect	Section
						Weights
<i>DomInv</i>	1.046*** (2.801)	1.725*** (3.564)	1.771*** (3.320)	1.019*** (2.624)	2.092*** (4.594)	1.544*** (2.708)
<i>Trade</i>	1.130** (1.948)	0.14 (0.615)	-0.240 (-0.928)	1.333*** (2.624)	0.393* (1.697)	0.221 (0.776)
<i>School</i>	-0.214 (-0.459)	0.349 (0.831)	0.409 (1.244)	-0.336 (-0.619)	0.365 (0.821)	-0.009 (0.025)
<i>Lend</i>	0.070*** (2.536)	-0.012 (-0.258)	0.083*** (2.787)	0.072*** (2.714)	0.021 (0.568)	0.084*** (2.940)
<i>GovExp</i>	-1.220 (-1.180)	-1.349** (-2.272)	-3.623*** (-3.458)	-1.572 (-1.497)	-1.388*** (-2.546)	-4.324*** (-3.798)
<i>Pop</i>	-0.341*** (-2.952)	-0.394* (-1.702)	-0.566*** (-3.119)	-0.333*** (-2.739)	-0.431** (-1.907)	-0.516*** (-2.770)
<i>FDI</i>	0.033 (0.535)	-0.017 (-0.346)	-0.024 (-0.506)			
<i>FPI</i>				-0.041 (-1.252)	-0.070*** (-3.255)	-0.090*** (-2.209)
<i>BankCred</i>	-0.211* (-1.814)	-0.671*** (-4.727)	-0.621*** (-5.945)	-0.189** (-1.896)	-0.707*** (-5.208)	-0.488*** (-3.520)
<i>StkCap</i>	0.218* (1.882)	0.452*** (4.485)	0.460*** (4.676)	0.197* (1.721)	0.418*** (4.613)	0.410*** (4.207)
Adj. R^2	0.603	0.270	0.465	0.605	0.311	0.493
Obs.	390	390	390	390	390	390

Notes: OLS and FGLS refer to the ordinary least squares and feasible generalized least squares estimation, respectively.

Regressions (1) and (4) include the country and time fixed effects estimations.

All variables are in logarithm. T-statistics are reported in parentheses.

Cluster-robust standard errors are used.

***, **, * indicate significance at 1%, 5%, & 10%.

Table 2: 2SLS & GMM Estimates of the EMU Effect on Economic Growth

	(1)	(2)	(3)	(4)	(5)	(6)
	1987-2012	1987-1999	2000-2012	1987-2012	1987-1999	2000-2012
	2SLS	2SLS	2SLS	GMM	GMM	GMM
<i>DomInv</i>	1.048*	2.856***	1.012	2.520***	5.405***	1.764*
	(1.700)	(3.050)	(1.415)	(2.761)	(4.610)	(1.703)
<i>Trade</i>	-1.899***	2.225	0.129	2.111***	6.385***	0.699
	(-2.767)	(0.827)	(0.123)	(2.578)	(4.716)	(0.883)
<i>School</i>	-0.354	0.337	-1.045*	-0.941	2.340***	-2.593***
	(-0.882)	(0.245)	(1.665)	(-1.366)	(2.324)	(-2.804)
<i>Lend</i>	0.061	-0.044	0.241***	0.044	-0.023	0.087
	(1.370)	(-0.636)	(2.385)	(1.389)	(-0.696)	(0.673)
<i>GovExp</i>	-3.601***	-3.316***	-1.810	-3.067***	-4.698***	0.769
	(-2.063)	(-2.464)	(-0.850)	(-2.537)	(-2.528)	(0.490)
<i>Pop</i>	-0.473**	-0.404	-0.184**	-0.006	-0.679	0.073*
	(-1.991)	(-0.852)	(-1.981)	(-0.048)	(-0.854)	(1.714)
<i>FDI</i>	0.334	-0.959	0.671	0.389	-1.378	0.561
	(0.744)	(-1.358)	(1.389)	(0.819)	(-1.435)	(1.526)
<i>BankCred</i>	-0.673***	-1.206***	-1.431***	-0.900***	-1.867***	-0.706***
	(-2.513)	(-2.488)	(-4.089)	(-2.664)	(-3.375)	(-2.424)
<i>StkCap</i>	1.086***	1.028***	0.351	-0.055	0.162	1.261***
	(3.600)	(2.217)	(0.660)	(-0.084)	(0.341)	(2.979)
Adj. R^2	0.316	0.279	0.321			
J-statistic				7.095	1.622	4.341
AR(1) Test				-1.885	-2.218	-2.029
(p-value)				(0.060)	(0.027)	(0.042)
AR(2) Test				-2.103	-0.572	-0.056
(p-value)				(0.036)	(0.567)	(0.955)
Obs.	390	195	195	390	195	195

Notes: 2SLS and GMM refer to the two-stage least squares and system generalized method of moments estimation, respectively.

Regressions (1) to (3) are controlled for the cross-section fixed effects.

All variables are in logarithm. T-statistics are reported in parentheses.

Cluster-robust standard errors are used.

***, **, * indicate significance at 1%, 5%, & 10%.

Table 3: 2SLS & GMM Estimates of the EMU Effect on Economic Growth

	(1)	(2)	(3)	(4)	(5)	(6)
	1987-2012	1987-1999	2000-2012	1987-2012	1987-1999	2000-2012
	2SLS	2SLS	2SLS	GMM	GMM	GMM
<i>DomInv</i>	1.269*** (2.199)	1.371** (1.834)	0.751 (1.342)	3.689*** (2.956)	4.602*** (3.273)	4.179* (1.692)
<i>Trade</i>	-2.206 (-1.522)	3.479*** (2.452)	0.059 (0.051)	-0.129 (-0.111)	2.453 (0.658)	-0.994 (-0.250)
<i>School</i>	0.347 (0.673)	-0.138 (-0.138)	-0.974*** (-2.429)	3.674 (1.309)	2.471 (1.014)	1.410 (-0.794)
<i>Lend</i>	0.044 (0.899)	0.030 (0.812)	0.191*** (2.869)	0.042 (1.032)	-0.008 (-0.297)	0.180 (1.330)
<i>GovExp</i>	-2.862 (-1.505)	-5.294*** (-5.641)	-2.998** (-1.983)	-3.913*** (-2.844)	-3.337 (-1.509)	-12.873 (-0.922)
<i>Pop</i>	-0.509*** (-2.719)	-0.946** (-2.222)	-0.215 (-0.999)	0.321* (1.822)	-0.308 (-0.343)	0.122 (0.798)
<i>FPI</i>	0.145 (0.930)	-0.361 (-1.485)	-0.048 (-0.188)	1.126 (1.332)	0.249 (0.530)	5.548 (0.816)
<i>BankCred</i>	-0.792*** (-2.519)	-0.933** (-2.045)	-1.149*** (-2.756)	-1.691** (-1.931)	-1.504*** (-2.195)	-7.043 (-0.784)
<i>StkCap</i>	1.268*** (2.574)	0.318 (0.686)	0.898* (1.812)	0.808** (2.020)	0.216 (0.234)	-1.735 (-0.408)
Adj. R^2	0.273	0.535	0.546			
J-statistic				0.358	0.055	0.312
AR(1) Test (p-value)				-2.721 (0.007)	-2.421 (0.016)	0.455 (0.649)
AR(2) Test (p-value)				0.318 (0.751)	-0.922 (0.357)	-0.020 (0.984)
Obs.	390	195	195	390	195	195

Notes: 2SLS and GMM refer to the two-stage least squares and system generalized method of moments estimation, respectively.

Regressions (1) to (3) are controlled for the cross-section fixed effects.

All variables are in logarithm. T-statistics are reported in parentheses.

Cluster-robust standard errors are used.

***, **, * indicate significance at 1%, 5%, & 10%.

Table 4: Lagged Estimates of the EMU Effect on Economic Growth

	(1) 1987-2012 Cross-Section Weights	(2) 1987-2012 2SLS	(3) 1987-2012 GMM
<i>DomInv</i>	1.046** (2.123)	-1.813** (-1.955)	4.104 (0.380)
<i>Trade_{t-1}</i>	-1.068*** (-3.743)	-4.322** (-2.108)	-1.407 (-0.417)
<i>School_{t-1}</i>	1.048*** (2.960)	-0.833 (-0.915)	2.507 (1.204)
<i>Lend</i>	0.069*** (2.624)	0.005 (0.099)	0.072 (0.369)
<i>GovExp</i>	-5.010*** (-4.443)	-6.273*** (-3.204)	-1.196 (-0.083)
<i>Pop</i>	-0.353** (-2.122)	0.037 (0.123)	-0.129 (-0.173)
<i>FDI_{t-1}</i>	-0.129*** (-2.594)	-0.296 (-0.382)	0.866 (0.338)
<i>BankCred_{t-1}</i>	-0.432*** (-3.748)	-0.377 (-1.082)	-0.544 (-0.378)
<i>StkCap_{t-1}</i>	0.450*** (4.875)	2.286*** (4.119)	-0.179 (-0.029)
Adj. R^2	0.479	0.063	
J-statistic			2.085
AR(1) Test (p-value)			-0.464 (0.643)
AR(2) Test (p-value)			-0.278 (0.781)
Obs.	389	389	389

Notes: 2SLS and GMM refer to the two-stage least squares and system generalized method of moments estimation, respectively.

All variables are in logarithm. T-statistics are reported in parentheses.

Cluster-robust standard errors are used.

***, **, * indicate significance at 1%, 5%, & 10%.

Table 5: FGLS Estimates of the Interaction Effect on Economic Growth

	(1)	(2)	(3)	(4)	(5)
	1987-2012	1987-2012	1987-2012	1987-2012	1987-2012
	Cross-Section	Cross-Section	Cross-Section	Cross-Section	Cross-Section
	Weights	Weights	Weights	Weights	Weights
<i>DomInv</i>	1.777*** (3.326)	1.784*** (3.272)	1.732*** (3.196)	1.755*** (3.253)	1.649*** (2.587)
<i>Trade</i>	-0.246 (-0.823)	-0.198 (-0.748)	-0.259 (-1.006)	-0.346 (-0.894)	-0.330 (-1.401)
<i>School</i>	0.410 (1.233)	1.209** (2.027)	0.348 (1.321)	0.739 (1.036)	0.205 (0.634)
<i>Lend</i>	0.083*** (2.729)	0.087*** (2.947)	0.077*** (2.535)	0.083*** (2.659)	0.069** (2.055)
<i>GovExp</i>	-3.622*** (-3.448)	-3.752*** (-3.668)	-3.475*** (-3.291)	-3.554*** (-3.362)	-4.125*** (-3.557)
<i>Pop</i>	-0.568*** (-3.106)	-0.584*** (-3.084)	-0.565*** (-2.990)	-0.584*** (-2.974)	-0.616*** (-2.661)
<i>FDI</i>	-0.070 (-0.158)	2.073* (1.669)	0.753* (1.809)	1.431 (1.103)	
<i>BankCred</i>	-0.622*** (-5.665)	-0.635*** (-6.265)	-0.338** (-1.953)	-0.358* (-1.785)	
<i>StkCap</i>	0.462*** (4.453)	0.439*** (4.296)	0.350** (2.306)	0.381** (2.087)	
<i>FDI*Trade</i>	0.021 (0.098)			0.189 (0.595)	
<i>FDI*School</i>		-1.028* (-1.710)		-0.499 (-0.741)	
<i>FDI*BankCred</i>			-0.467*** (-2.360)	-0.466* (-1.772)	-0.489*** (-5.756)
<i>FDI*StkCap</i>			0.123 (0.987)	0.090 (0.562)	0.564*** (5.218)
Adj. R^2	0.463	0.467	0.464	0.462	0.426
Obs.	390	390	390	390	390

Notes: FGLS refers to the feasible generalized least squares estimation.

All variables are in logarithm. T-statistics are reported in parentheses.

Cluster-robust standard errors are used.

***, **, * indicate significance at 1%, 5%, & 10%.

Table 6: 2SLS & GMM Estimates of the Interaction Effect on Economic Growth

	(1)	(2)	(3)	(4)	(5)	(6)
	1987-2012	1987-1999	2000-2012	1987-2012	1987-1999	2000-2012
	2SLS	2SLS	2SLS	GMM	GMM	GMM
<i>DomInv</i>	1.352*** (2.187)	2.584*** (4.498)	1.111* (1.671)	3.472*** (3.798)	4.465*** (2.851)	2.649** (2.310)
<i>Trade</i>	-0.900 (-1.392)	3.987*** (3.672)	0.678 (0.494)	1.623 (1.379)	6.311*** (3.489)	0.506 (0.524)
<i>School</i>	-0.517 (-0.716)	0.273 (0.311)	-0.404 (-0.306)	-0.354 (-0.505)	1.244 (0.871)	-1.860** (-2.043)
<i>Lend</i>	0.038 (0.983)	-0.033 (-0.578)	0.062 (0.645)	0.004 (0.091)	-0.004 (-0.094)	0.011 (0.084)
<i>GovExp</i>	-2.523 (-1.602)	-2.411 (-1.203)	2.011 (0.432)	-4.238*** (-3.026)	-5.990*** (-2.135)	-3.166 (-1.141)
<i>Pop</i>	-0.505* (-1.749)	-0.592* (-1.732)	0.016 (0.074)	0.161* (1.669)	-0.512 (-0.600)	0.148** (1.937)
<i>FDI*BankCred</i>	-1.039*** (-0.244)	-1.376*** (-2.967)	-1.960*** (-3.675)	-0.898*** (-2.348)	-1.348 (-1.291)	-0.762** (-1.931)
<i>FDI*StkCap</i>	1.371*** (4.883)	1.011** (1.997)	2.533*** (3.286)	0.956** (2.290)	0.584 (0.643)	0.996* (1.808)
Adj. R^2	0.306	0.445	0.223			
J-statistic				3.708	3.544	4.132
AR(1) Test (p-value)				-2.746 (0.006)	-1.770 (0.077)	-2.281 (0.023)
AR(2) Test (p-value)				-1.147 (0.252)	-0.109 (0.914)	-2.022 (0.043)
Obs.	390	195	195	390	195	195

Notes: 2SLS and GMM refer to the two-stage least squares and system generalized method of moments estimation, respectively.

Regressions (1) to (3) are controlled for the cross-section fixed effects.

All variables are in logarithm. T-statistics are reported in parentheses.

Cluster-robust standard errors are used.

***, **, * indicate significance at 1%, 5%, & 10%.

Table 7: Lagged Estimates of the Interaction Effect on Economic Growth

	(1)	(2)	(3)
	1987-2012	1987-2012	1987-2012
	Cross-Section	2SLS	GMM
	Weights		
<i>DomInv</i>	1.106** (1.923)	0.662 (1.121)	2.479** (1.986)
<i>Trade_{t-1}</i>	-0.899*** (-5.223)	-0.575 (-0.815)	1.319 (1.332)
<i>School_{t-1}</i>	1.035*** (3.303)	0.745*** (2.270)	-1.307 (-1.527)
<i>Lend</i>	0.074*** (2.848)	0.030 (1.122)	0.055 (0.933)
<i>GovExp</i>	-5.281*** (-4.580)	-4.344*** (-3.425)	-8.686*** (-3.683)
<i>Pop</i>	-0.426** (-2.078)	-0.158 (-1.092)	0.203** (1.953)
<i>FDI_{t-1}*BankCred_{t-1}</i>	-0.408*** (-0.104)	-1.195*** (-3.816)	0.963** (2.096)
<i>FDI_{t-1}*StkCap_{t-1}</i>	0.419*** (4.928)	1.160*** (3.927)	-1.580*** (-2.512)
Adj. R^2	0.458	0.321	
J-statistic			8.749
AR(1) Test (p-value)			-2.794 (0.005)
AR(2) Test (p-value)			-0.430 (0.668)
Obs.	389	389	389

Notes: 2SLS and GMM refer to the two-stage least squares and system generalized method of moments estimation, respectively.

All variables are in logarithm. T-statistics are reported in parentheses.

Cluster-robust standard errors are used.

***, **, * indicate significance at 1%, 5%, & 10%.